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The work of Spanish men. A quantitative analysis based on census data, 1900-1970 *

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Abstract

This paper presents a historical examination of employment in old age in Spain, in order to characterize this labour segment and identify and analyse its specific problems. One of these problems is the life-cycle deskilling process, already shown for certain national cases. This study explores whether this hypothesis also holds in Spain. The perspective used is essentially quantitative, as our analysis is based on the age-profession tables in Spanish population censuses from 1900 to 1970.

Keywords: old age, labour markets, retirement.
JEL classification: J14, J21, J26

Resumen

El objetivo de este trabajo es el de examinar, desde una perspectiva histórica, el trabajo en la vejez a fin de caracterizar este segmento del mercado de trabajo y detectar problemáticas específicas. Una de estas es el proceso de *life-cycle deskilling*, detectado ya en algunos otros casos nacionales. Nuestro trabajo intenta demostrar si esta hipótesis también se aplica al caso español. El enfoque seguido es fundamentalmente cuantitativo, al haberse explotado como fuente las tablas profesionales por edad contenidas en los censos nacionales de población entre 1900 y 1970.

I. Introduction

The structure of labour markets has undergone major changes in recent decades, the most important being the mass incorporation of women to the labour force and the progressive withdrawal of older workers. With respect to the latter the magnitude of the change becomes even more notable if the evolution of the decision of whether to work during old age is examined in the long run. The management of the last years of a person's life is a delicate task in which economic, social, psychological factors interact. The consolidation of industrial societies with their more arduous working conditions exacerbated these difficulties in old age.

So far, the historical study of living conditions in old age has been based on an analysis of assistance networks, that is, institutions which, either formally or informally, provided for those who had retired from work without sufficient resources for the last years of their lives. However, a perspective of this kind cannot offer a full vision of the issue of old age. In fact, the elderly have usually been cared for by their families. In the worst cases, the use of public utilities was associated with the last years of an individual's life, when physical limitations made it impossible to work. Assistance institutions were a last resort; most old people remained in the labour market, often at any price, and accepting unpleasant changes in their conditions[1] due to their progressive loss of ability. As a result, in order to obtain a more comprehensive view of the living conditions and economics in old age, our appraisal must be based on participation in the labour market.

[1] An individual's decision to continue to work does not rule out the possibility that family solidarity may also play a complementary role in his sustainment at old age.

This field of analysis underwent profound and interrelated changes during the twentieth century in response to the modifications in the framework of labour relations at higher ages. First, we find the gradual consolidation of public insurance, despite the fact that its introduction – especially in Spain – was actually slow, modest and uneven. Second, the structure of production changed dramatically: the physical nature of work decreased, but the demand for qualifications grew ever higher. This study sets out to analyse the effect of the fundamental changes of the past century on the position of older workers in the labour market. We assess the problems facing older workers that led to the introduction of a legal retirement age, and also the effect of exogenous processes on this labour segment.

Among the features that define older workers, this study will focus above all on the life-cycle deskilling hypothesis. This hypothesis proposes that the occupations available to older workers become progressively more limited. As our main source, we use the age-profession tables from the national population census, which will allow a quantitative analysis similar to those published for some other national cases[2].

The paper is structured as follows. First, we will review certain current and contemporary perceptions of the ageing problem. Special attention will be paid to the ideas of the Spanish reformists, given their key role in the first major attempts to provide State economic protection for the elderly, dating from the first third of the twentieth century. The goal in this section will be to identify ideas related to the social and economic consequences of old age, and then test their applicability to the Spanish case. Second, we calculate the presence of older men in the labour market on the basis of the employment rates recorded in the census, bearing in mind the scale and the evolution of this variable over the time period under study. After its comparison with other countries, we will be

[2] Most notably, RANSOM, SUTCH (1986), RANSOM, SUTCH (1988) and JOHNSON (1994). Also CARTER, SUTCH (1996) and LEE (2002).

able to judge whether old age employment was comparatively widespread in Spain. The third part centres on the breakdown into sectors of the employment of older men. Having seen the overall employment rate of older men in the previous section, we will establish whether this participation was characterized by differentiated occupational patterns, as some previous reports have suggested. Next, we discuss possible causes of the trends identified. The final section concludes.

II. Theoretical framework

Since the idea of a life-cycle in the work profile first appeared in Gary BECKER's[3] seminal works, other authors have applied and expanded on it. In Becker's theory, individual wage gains grow with age until a peak is reached, after which they decline. It follows that, in the absence of internal labour markets, the ageing of a worker worsens his relative position in the market. A number of explanations have been put forward.

The commonest is the loss of physical capacity associated with ageing. Popular belief supports this argument, but the growing number of studies published since the rise of industrial gerontology have not provided conclusive results; in fact, far from confirming this intuition, some actually challenge it[4]. However, all these studies suffer from a selection bias: when examining the productivity of older workers who remain in employment, workers fired due to their reduced productivity are not included, meaning that the average abilities and productivity of this cohort are overestimated[5]. In spite of this, the existence of productivity differentials between older and younger workers employed in manual sectors is generally accepted [6].

[3] BECKER (1964).
[4] For a review, see JOHNSON, ZIMMERMANN (1993), p. 10 and JACKSON (1998), p. 97
[5] POSNER (1995), p. 359 and HURD (1996), p. 21
[6] HURD (1996), pp. 20-21.

Other assumptions regarding the effects of the ageing of workers on their position in labour markets may also be questioned. For instance, it is believed that human capital depreciates inexorably because of the constant evolution of the working environment, which, in time, renders specific knowledge and abilities obsolete. But the fact is that neither human capital depreciates so rapidly, nor is the advance of technical change so relentless[7].

As for older workers' human capital, knowledge in the form of experience or problem-solving abilities[8] is an asset acquired with age which may well compensate for what these workers now lack in terms of theoretical and technical knowledge in comparison with their younger workmates. It is actually the balance between dynamic and static intelligence within the mix of optimal knowledge in a given workplace that allows us to derive conclusions on the position of older worker in the market. However, a situation in which the natural decline in dynamic intelligence is added to offset by high-intensity, cheap transfer of static intelligence towards younger colleagues is undoubtedly unfavourable for the eldest[9].

There are two factors that qualify the generally negative effect of technical change on human capital maintenance: the pace of technological change and the duration of training. On the one hand, a sector in which there is little technological change, and abilities are both slow to acquire and slow to depreciate, is a favourable scenario for older workers. In this case, the age gap between a worker starting and finishing their training period reduces the difference between their situation and that of older workers. Besides, the possibility of retaining these skills for the rest of one's working life guarantees a similar level of knowledge throughout the age spectrum of trained workers. The ideal setting for an older worker is a sector in which technology remains constant and skills do not depreciate.

[7] POSNER (1995), pp. 53& ss.
[8] JACKSON (1998), p. 97
[9] POSNER (1995), p. 69

On the other hand, in sectors with accelerated technological change the position of older workers is more precarious. However, the existence of short training periods favouring greater adaptability might reverse the situation. For instance, in a context of fast technological change where abilities depreciating rapidly, short training periods are the only way to ensure a complete return on educational investment before a new innovation emerges. Thus, in a situation in which all workers lack new technological know-how, combined with brief depreciation periods of essentially transitory abilities, they are all equally attractive for the sector irrespective of their ages. We can conclude that the position of older workers in the market is optimized in the extreme scenarios, that is when skills are unchanging or when they must be constantly updated. Later, in our numerical analysis of the sectoral breakdown of older workers, we will consider the most interesting cases along this continuum of possible scenarios in order to see how the model works in reality.

However, outside these extreme cases, ageing has been traditionally linked to a decrease in employability. We aim to test this hypothesis for the Spanish case. This assumption is associated with the decline in productivity, but how does it manifest itself? If first we look at possible reactions within a single firm, the commonest expressions of the phenomenon are the extension of working hours or the introduction of pay systems that are more closely related to output, such as piece-rate pay or bonuses[10]. Alternatively, employers may transfer their eldest workers to posts or areas of the firm with less physical demands but at lower rates of pay[11]. This process is likely to occur outside the margins of a single firm or sector. Ageing, then, brings not only lower pay but downward sectoral mobility as well. The causes for this pattern are several[12]. On the supply side, the worker must adapt his physical decline to a suitable job. On the demand side, employers are reluctant to hire or keep on their eldest

[10] REID (1985), p. 153
[11] CLARK, SPENGLER (1980), p. 7
[12] JOHNSON, FALKINGHAM (1992), p. 6

employees. Finally, and taking a neoclassical – but quite idealistic – point of view, workers may make a rational choice in pursuit of more leisure time.

So far, we have briefly reviewed the theoretical explanations for the life-cycle deskilling process in old age. We will now see that this framework was already implicit in more intuitive views of the issue. Specifically, we will concentrate on the ideas of the Spanish reformists with regard to the position of old workers in the labour market.

III. Contemporary views of old age and work

The unbounded confidence of liberal thinking on work as an infallible source of prosperity was soon tempered by the presence of an elderly population who, though active in the labour market for the greater part of their lives, faced need and deprivation in their final years. The belief that individual management of income through saving was the best guarantee for a secure future endured throughout the nineteenth century, giving rise to quite extreme positions that even condemned the provision of any public assistance at all[13].

However, it was clear that workers were more vulnerable than the short-sighted liberal theorists believed. The scale of mobile or occasional poverty associated with industrial work has often been stressed[14]. The threat of poverty

[13] At the National Sociology Conference of Valencia in July 1883 Daniel BALACIART claimed that: '*official charity is socialist and thus wrongly organized; besides, it makes the individual trust in the security of shelter so providing him with an excuse not to subject himself to the rigour of thrift'*. Our translation from CASTIILLO (1985), p. 61.

[14] In this regard, MAZA insisted on the high risk and economic instability associated with the capitalist economy, which '*after any minor circumstance or unfortunate event (illness, retirement, accident) (...) surpasses the conventional margins of unproductive sectors (real poverty, assisted or not), to become a real, and increasingly clear, threat for inhabitants in the country and the city, with hardly any distinction'*, our translation from MAZA (1999), pp. 11-12. The same idea in MAZA ZORRILLA (1987), p. 19. Evidence on the wider scope of poverty was already found in the contemporary studies by ROWNTREE (2000 [1901]). He estimated that 27.4% of the people of York lived in secondary poverty in 1899 (p. 117).

was always present, and workers who were in theory well established in the productive sectors of society might easily fall on hard times. Of course those with most to lose in this situation were the workers with limited adaptability or, more simply, those less suited for physical exertion in the workplace.

Solutions for these problems were found mostly within the family context[15]. The assumption of intergenerational solidarity is reflected in the ideology of the first phase of the Spanish reformist movement. Its central concerns were to establish restrictions on child and female labour and to prevent against industrial accidents[16]. The position of elderly workers was not such a priority, at least until 1908[17], when the first old age public insurance system was introduced. The issue came to the fore during the debate and subsequent approval of the compulsory old age insurance in 1919[18].

So, for example, the social Catholics called on employers not to abandon old workers as if they were 'useless tools'[19]. Besides the ethical argument, old age insurance was also justified on the grounds of its benefits for production, from an openly utilitarian point of view; the aim of insurance was not only

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Results obtained by Charles BOOTH in *Life and labour of the people in London*, (1889-1903) were no more optimistic (30,7%).

[15] REHER (1996), p. 149. Tthe author states notes a higher propensity to live in complex and non-nuclear households in the over-sixties (p. 136).

[16] The passing of the 1900 Dato Act of employer liability is generally seen as the first public effort of labour protection. On the other hand, the regulation of child and female labour had also become a priority after the complete failure to enforce the 1873 Benot Act. On March 13, 1900, a new regulation on this subject was passed. For further details, see NIELFA (2004), pp. 135 ff.

[17] PALACIO MORENA (2004a), PALACIO MORENA (2004b), ch.1; PALACIO MORENA (1988), CALLE (1989).

[18] In spite of the reformists' intense discussion of the issue of old age, the compulsory old age pensions were ineffective. Their launching in 1921, after the publication of their application rules, fully excluded those above 65 from protection. Also, individuals older than 45 were equally excluded from insurance benefits, as they were only expected to receive the accumulated sum of their capital on their retirement. However, the low rates of pensions (365 ptas. per year) and their irregular delivery, particularly in agriculture, did not make full-right affiliates any better-off. On these issues, see ELU TERÁN (2004).

[19] LÓPEZ VALENCIA (1913), p. 14.

individual relief but also the maintenance of productive forces[20]. Old age pensions would achieve a balance in the trade-off between need as the force driving an uninterrupted supply of labour and the requirement for a certain degree of motivation, effort and efficiency in favour of productivity and industrial progress[21]. Old age insurance would also have a second effect, relieving the State from the need to provide public assistance in the form of poor relief.

As we said, productivist arguments were much in evidence in the literature and propaganda flourishing in Spain during the first two decades of the century and played an important part in the process of creation and development of State pensions. Under the surface lay the awareness that the individual's labour force – the only capital workers take to the labour market – is finite. Francesc MORAGAS, manager of the *Savings and Old Age Pensions Bank of Barcelona*, a pioneering institution in the economic management of workers' old age, made the point clearly:

> 'Human employment is, as an economic concept, truly a capital producing income, and the possession of such capital and its yield means the fulfilment of individual and family needs. But human activity is a capital that, following the life cycle, is first born, then grows, diminishes and disappears; and the parallelism through which in each man's life the strength of his activities and the capacity of capital that they represent is not accompanied by another parallelism between that capacity and his individual or family needs. On the contrary, it can be said that these needs and that capacity very often follow diverging lines, whose only coincidence lies at their extreme points of extreme poverty and ruin'[22].

[20] STEIN (1933, [1908]), pp. 5-6. This is the same as the 'depreciation expense' mentioned in AZNAR (1935), p. 705

[21] STEIN (1933, [1908]), p. 4. Also in CUESTA BUSTILLO (1988), p. 47 in her review of reformist justifications.

[22] Our translation from MORAGAS y BARRET (1963 [1912]), pp. 26-27. The quote is from his speech 'Hierarchy of social insurance institutions' given in Barcelona on January 28th, 1912.

It is now time to examine how far these opinions are borne out by the information available from the census. The following section presents a quantitative analysis of the work of older men in aggregate terms.

IV. Reconstruction of aggregate employment rates among older men through the national population censuses

Ten-year population records from the census are an appropriate source for the analysis of the age structure of professional classifications of the workforce in the long-term. From 1900 onwards, when age and profession were cross-tabulated for the first time, this source allows us to distinguish between working and retired individuals in the long term.

The use of population records as a source has been subject to some criticism[23]. Due to the fundamental problem represented by the underestimation of female employment, our study will be restricted to the male working population. Further, the records for employment and retirement (especially in the earlier years) may not be entirely accurate, since retired individuals may have been listed not as retired but according to their pre-retirement occupations[24]. We should also treat the estimations of old workers employed in the agriculture sector with some caution; the nature of the activity makes it hard to distinguish between real employment and occasional participation in the everyday tasks of the family, and the inclusion of these subjects might distort the

[23] For a critical analysis of Spanish census data, see NICOLAU (1989). Also CAMPS (1997) and, for the underestimation of the female workforce, SARASÚA (2000). This particular issue has appeared in some other important studies. HATTON & BAILEY (2001) is a detailed review of the evolution of the underestimation of female employment from the mid-nineteenth century until the 1980s in Britain (pp. 88-92).
[24] JOHNSON (1994), p. 109 argues that this happened in England until 1901. For the US, the criterion remained until 1940: RANSOM, SUTCH (1989), p.1

results[25]. Despite these difficulties, we believe that the census data are reliable enough for a thorough, well-grounded analysis.

The main trouble with the censuses is their annoying heterogeneity. As regards the quality of the professional classifications, the 1920 census is much poorer than the earlier records. The groups of professions are much less detailed and there are only three age groups[26]. The 1930 and 1940 records are substantially better[27], but unfortunately, the following ones are not; the 1950 classifications are very general and the 1960 census does not even include an age-profession table.

The definition of age intervals presents some technical inaccuracies too, which meant that we cannot produce a complete matrix reconstruction of labour participation rates for the diverse age-groups and cohorts in the various censuses. We encountered distortions of two kinds. The first was the classification of age groups in ten-year groups from the age of 25 onwards the 1950 census. This meant that we could not aggregate the data from that year with those of the remaining censuses, in which the age groups correspond to decades (i.e. 20 – 30, 30 – 40 and so on). Second, the age brackets in 1920 were poorly defined, and in the 1900 and 1910 census the age groups covered 20-year brackets. To avoid oversimplifying the table due to the homogeneity-requirement, in these cases we point out that the participation rates indicated actually correspond to the merging of two of the age groups indicated on the

[25] According to LEE (1998), p. 852: *'It has been suggested (…) that the flexible nature of farming made it possible for older farmers to adjust work according to their physical capacity, presence of other work-hands, or economic needs. Owing to the nature of farming, some older farmers could have stayed in a grey area between work and retirement. Therefore, it would have been sometimes ambiguous for census enumerators to determine the gainful occupation of such aged farmers'.*

[26] Under 21, from 21 to 60 and over 60. However, this census provides better results for the profession or nature of employment. However, note that the general criterion used in this paper is occupational.

[27] However, for the latter case, serious doubts about its reliability, due to the special circumstances in which it was produced.

horizontal axis of the matrix[28]. We also indicate that minimal discrepancies in the definition of age starts for age-brackets among censuses – in fact, only a year – adds a certain inexactness to the cohorts derived in the matrix. For example, as the 1930 census actually refers to the age group between 21 and 30 years, it refers to the cohort born between 1900 and 1909. The footnote in table 1 mentions all the cells in which discrepancies of this sort are found.

The census format simplifies the analysis of the occupation of old workers, despite the fact that the 1920 and 1930 censuses tabulate the over-sixties rather than those aged "60 and over", as the others do. More importantly, the 1950 census begins its oldest group at the age of 65[29]. Working with the 60-year threshold – and not the figure of 65, which is more familiar today – has the advantage of focusing on the desired level of study, that is, the workers who were of normal employment age, not those who stayed on after the legal retirement age (65). However, this same fact will not allow us to draw any conclusions on the effect on employment of the various public old age insurance systems implemented during the period. Lastly, we should stress that in the 60 and over group, given its open-interval character, there is no strict correspondence with the cohort indicated.

[28] The alternative to this would not have increased the visual complications introduced by our procedure. This alternative would have involved sacrificing the ten-year aggregation in the matrix to transform age groups into twenty-year-wide intervals. Apart from wasting the richness of later censuses, this solution would have greatly complicated the appearance of the table, as it mixes 20-year groupings with information cuts separated by only ten years.

[29] As we said, we have ten-year age groups for 1950, so it was not possible to derive indirectly (weighing narrower age groups) the number of workers above 60.

Table 1 *Male participation matrix for age groups and cohorts in Spanish population censuses, 1900-1970*

cohorts		age groups 20-29	30-39	40-49	50-59	60+	
-1840						84,27	1900
1841-1850					97,24[b]	88,10	1910
1851-1860				97,24[b]	98,46[b]	84,08	1920
1861-1870			95,46[a]	98,46[b]	92,80[c]	83,27	1930
1871-1880	1900	95,46[a]	97,00[a]	92,80[c]	92,80	85,76	1940
1881-1890	1910	97,00[a]	92,80[c]	95,56	94,19		
1891-1900	1920	92,80[c]	96,97	95,21			
1901-1910	1930	95,79	94,94			39,02	1970
1911-1920	1940	93,09			98,73		
1921-1930				96,00			
1931-1940			96,99				
1941-1950	1970	87,63					
1951-							

Source: information extracted from the Census record (see appendix).
[a]: 20-39; [b]: 40-59, [c]: 20-59
1900 and 1910: 20-39, 40-59, 60 and over.
1920: 21-60 (1899-1840), over 60.
1930: 21-30 (1900-1909), 31-40 (1899-1890), 41-50 (1889-1880), 51-60 (1879-1870), over 60 (1869-).
1940: 20-29, 30-39, 40-49, 50-59, 60 and more.
1970: 20-29, 30-39, 40-49, 50-59, 60 and more.

As table 1 shows, the rates of employment among older males are quite high throughout the period. If anything, in the 1920 figures there is a slight decline. Participation rises again for 1930, but not in the 50-59 age group (strictly speaking, 51-60). The other notable change is the fall in participation of the 20-29 age group in the 1970 census. This phenomenon responds, in all probability, to the increased access to high education. Concentrating now on the participation of the over-sixties, the data show both high and stable participation of this group throughout the period until 1970 when there is a sharp fall. Of course the gap between 1940 and 1970 is very big: big enough for the fall to be really steep. Tentatively, we can estimate the figure corresponding to older workers' participation for 1950 at 66.06%, though this refers to men aged 65 and more.

In spite of all this evidence, the decreasing trend shown in the matrix hides some important changes that during such a wide time-span, must have occurred. So, in order to obtain a fully homogeneous series, we have to account for changes in the age structure of males over 60. The growth in life-expectancy and, as a result, the increasing proportion of more advanced ages within the group is presumed to have included an upward bias on participation rates of the first censuses, given the declining propensity to work with respect to age. Unfortunately, this correction cannot be applied because, with the exception of our last census, we do not have smaller age breakdowns of the workers aged 60 or more, and so we cannot estimate participation rates in each census with weights corresponding to the age structure of older men in 1970.

However, certain possibilities are open to us if we try to account for the effects of the changes in the production structure of the Spanish economy. An exercise of this kind will seek to identify the diverse patterns of retirement in different professional sectors, particularly in agriculture. The evidence suggests lower retirement rates in this sector[30]. As a consequence, we would expect the decline of agriculture over the period under study to have been one of the most powerful factors in the fall in participation among older workers. This effect would be expected to be especially intense for Spain given the traditional importance of the sector[31]. To carry out this comparison, we first applied the rates of agricultural and non-agricultural labour for 1970 (26.53% and 73.47% respectively) to the sum of the working population registered in each of the other censuses. We then applied to these virtual figures of agricultural and non-agricultural workers the real, census-related rates corresponding to the male

[30] LEE (2002) shows how subjective retirement rates (retirement hazard rate) in agriculture are lower than in the rest of sectors for the US between 1880 and 1940. LEE also states that *'the basis for this explanation is the belief that farmers tended to stay in the labor force longer than those employed in nonagricultural occupations thanks to the greater flexibilty of farming'*, p. 512. This argument will be again used when we present our own evidence.

[31] In 1900 this sector – also including farming – employied 63.,29% of the male working population. In 1910, the figure was 59.79%; 62.07% in 1920; 49.99% in 1930; 54.,82% in 1940; 51.95% in 1950 and 26.53% in 1970.

population under 60 and over 60 employed in each of the two sectors. We thus obtained the rates of employment of older men for each census in accordance with the bivariate sectoral distribution of 1970.

The next step is to examine all of the sectoral changes produced in the economy, and mainly caused by the rise in service-related activities. We applied the employment rates for each of the 1970 sectors to each of the earlier censuses, using the 29 groups into which we classified the diverse professional definitions (more details below)[32]. With all these adjustments, we aimed to identify the changing attitudes towards retirement, removing the influence of employment in a particular sector.

Table 2 *Employment rates of men aged over 60, 1900-1970*

	1900	*1910*	*1920*	*1930*	*1940*	*1950*	*1970*
Rough	84,27	88,10	84,08	83,27	85,77	66,06	39,27
Agriculture-adjusted	70,46	75,16	72,30	71,57	70,69	52,42	39,27
All-sector adjusted	70,24	73,23	80,15	71,28	73,08	51,42	39,27

Source: information extracted from the from Census.
Note: for 1950, 65 and more.

Table 2 shows that the sectoral shift in the Spanish economy was indeed a powerful force behind the fall in employment among older men. However this impulse corresponds mainly to the decline in agriculture, given the very similar rates for agriculture-adjusted and all-sector-adjusted. The discrepancy between these two magnitudes in 1940 and, above all, 1920 suggests that at those times the service sector offered better job opportunities for older workers.

The analysis of these figures obviously reflects in some way the parallel development of public old age pensions. But the data – for males ≥60 and not

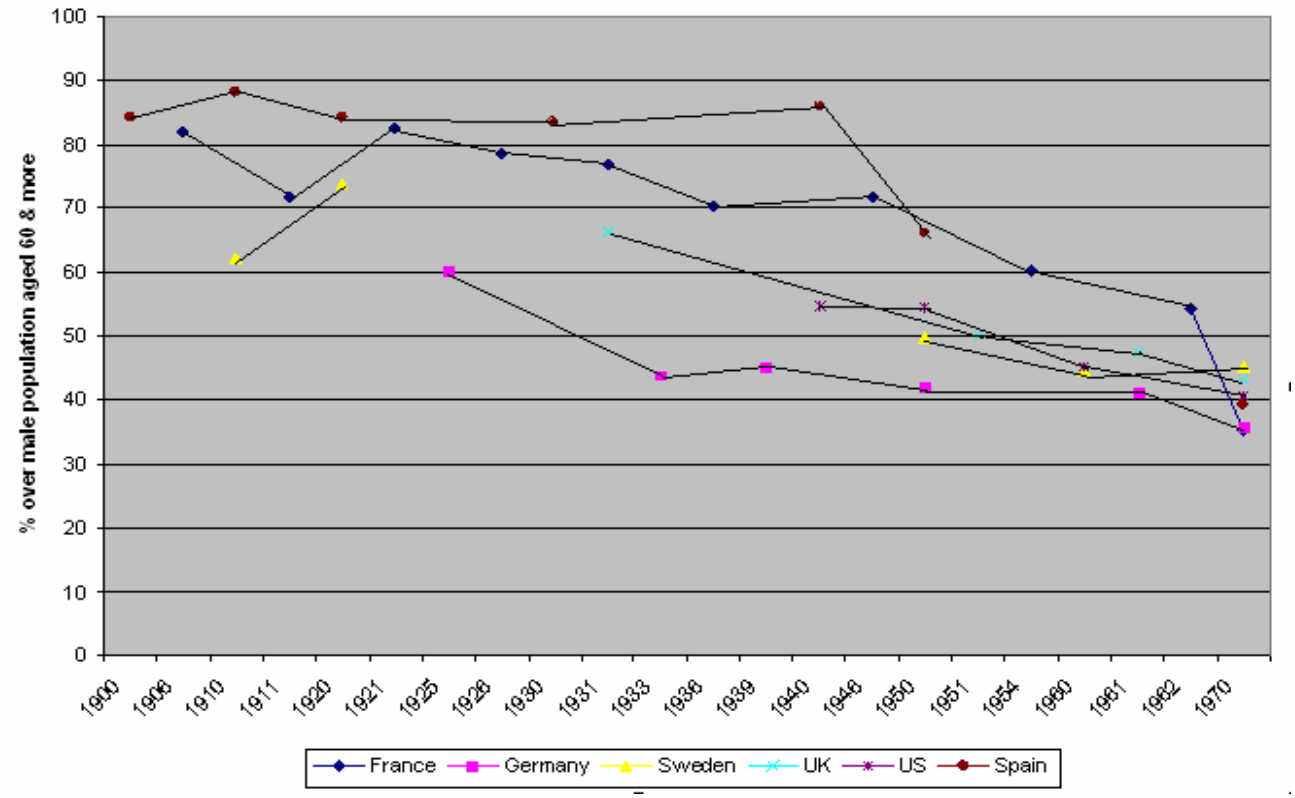
[32] Given that the 1970 census has no data for certain classifications recorded in previous census, the following aggregating criteria have been adopted: Alcohol, wine and tobacco are added to food industries; fur, and dress and shoe industries to textiles; storage to transport; professionals, clergy, army and labourers to others.

the legal retirement age of 65 – makes a careful comparison of the two variables essential. It is quite reasonable to think that the lower enforcement of legal retirement in agriculture mentioned above will contribute to keeping employment rates up in this sector[33]. Also, the lower rate of salary workers with respect to other sectors – that is, those covered by social insurance, especially during its first stages – appears to affect the final result.

In general the employment rates of older men are quite high. Possibly, the fact that the data were obtained directly from the informant himself may have influenced the figures. However, comparison of employment rates with other countries shows that Spanish figures, though the highest, do not stand out particularly (see figure 1).

[33] See note 18.

Figure 1 *Comparison of employment rates of men over 60, 1900-1970*



Source: for Spain, table 2. For the other countries JACOBS, KOHLI, REIN (1991a), pp. 38-41. French figures from 1921 to 1962 correspond to the 60-69 age group only. Employment in each age group was weighted using data from MITCHELL (2003a) and MITCHELL (2003b). The French figure for 1970 was weighted with the population in 1968.

V. Employment among older males from a sectoral perspective

After our examination of aggregate rates of employment among older men, we need to go down a level to detect the specific problems operating in this segment of the labour market.

We will examine for Spain the incidence of the *life-cycle deskilling* or *downward occupational mobility* hypothesis outlined above. To judge the consistency of this hypothesis, we need to build a measure of the overrepresentation of older workers with respect to their general weight in the labour force as a whole. To do this, we first grouped the range of professional categories in the census by sector. Despite the wide time interval and the many

changes in professional definitions and the detail into which they are broken down, we took careful to observe the homogeneity standards. We aimed to obtain a specification expressive enough to allow comparative exercises with other national cases already published [34].

Once we had organized the range of productive sectors and their age distributions, we were in a position to detect sectors in which the eldest workers – again defined as those aged 60 or more – are overrepresented or underrepresented in relation to the general occupational weight of a given sector in the economy. In order to capture this notion, an index of occupational concentration was constructed from the following ratio: on the numerator, we placed the percentage of the workforce aged 60 and more occupied in a given sector, and on the denominator, we placed the percentage of the total workforce, irrespective of age, employed in the same sector of the numerator. By construction, a ratio of 1 denotes full correspondence between the percentage of older men employed in a sector and the percentage of the workforce as a whole employed in this sector. Therefore, indexes above unity will screen the overrepresentation cases of workers above 60 years that interest us. Figure 5 shows the results of this exercise for each of the available census records.

[34] As far as possible, we intended to follow the pattern of JOHNSON (1994), p. 118.

Table 3 *Sectoral representativeness of male workers aged 60 and over*

		1900	*1910*	*1920*	*1930*	*1940*	*1950**	*1970*
1	Agriculture and farming	**1.168**	**1.187**	**1.149**	**1.299**	**1.281**	**1.390**	**1.805**
2	Fishing	**0.887**	**0.888**	**0.624**	**0.942**	**0.817**	**0.581**	**0.742**
3	Mining	**0.396**	**0.434**	**0.463**	**0.511**	**0.561**	**0.285**	**0.355**
4	Food industries	**0.690**	**0.699**	**0.513**	**0.606**	**0.672**	**0.598**	**0.758**
5	Alcohol and wine	**-**	**-**	**-**	**0.770**	**0.756**	**0.532**	**-**
6	Tobacco	**-**	**-**	**-**	**1.074**	**0.846**	**0.587**	**-**
7	Textile	**0.934**	**0.792**	**0.851**	**0.755**	**0.716**	**0.481**	**0.709**
8	Leather	**0.590**	**0.636**	**0.690**	**0.679**	**0.722**	**0.712**	**-**
9	Dressing and shoe	**0.616**	**0.668**	**0.659**	**0.824**	**0.865**	**0.548**	**-**
10	Paper and printing	**0.358**	**0.380**	**0.724**	**0.446**	**0.484**	**0.502**	**0.622**
11	Wood and furniture	**0.642**	**0.688**	**0.613**	**0.707**	**0.710**	**0.587**	**0.628**
12	Chemicals	**0.606**	**0.598**	**0.731**	**0.677**	**0.605**	**0.399**	**0.497**
13	Building and related products	**0.752**	**0.756**	**0.674**	**0.644**	**0.640**	**0.476**	**0.560**
14	Metals	**0.428**	**0.477**	**0.522**	**0.406**	**0.443**	**0.482**	**0.378**
15	Machinery and tools	**0.822**	**0.735**	**0.523**	**0.692**	**0.558**	**0.319**	**0.366**
16	Transport	**0.710**	**0.702**	**0.771**	**0.475**	**0.514**	**0.340**	**0.579**
17	Electricity, gas and water	**0.234**	**0.232**	**0.679**	**0.342**	**0.432**	**0.470**	**0.846**
18	Trade and retail	**0.605**	**0.536**	**0.938**	**0.618**	**0.750**	**0.767**	**1.080**
19	Storage	**0.476**	**0.516**	**-**	**-**	**-**	**0.561**	**-**
20	Communications	**0.789**	**0.692**	**0.710**	**0.668**	**0.732**	**0.472**	**0.506**
21	Professionals	**0.984**	**1.070**	**1.202**	**0.845**	**0.759**	**0.894**	**-**
22	Clergy	**1.344**	**1.438**	**1.199**	**1.708**	**1.991**	**2.374**	**-**
23	Food services	**0.849**	**0.873**	**-**	**0.661**	**0.600**	**0.549**	**0.675**
24	Services	**0.784**	**0.719**	**-**	**0.615**	**0.674**	**0.482**	**1.120**
25	Army	**0.092**	**0.076**	**0.110**	**0.112**	**0.098**	**-**	**-**
26	Administration	**0.988**	**1.131**	**1.173**	**1.348**	**1.119**	**0.567**	**1.046**
27	Domestic service	**0.700**	**0.673**	**1.079**	**1.070**	**1.255**	**1.245**	**0.797**
28	Labourers	**0.869**	**0.878**	**-**	**-**	**-**	**-**	**-**
29	Others	**0.726**	**0.807**	**1.194**	**0.848**	**0.866**	**1.070**	**0.597**

Source: own elaboration from the population census. If, for instance, a sector employs 10% of the oldest workers but only employs 5% of the total workforce, the resulting index (2) shows overrepresentation of old workers in that sector.
*aged 65 and more.

Table 3 shows that older workers are more overrepresented in the agricultural sector, corroborates the view that agricultural workers are more likely to remain in employment than workers in other sectors. The main reason

for this is assumed to lie in the sector's flexibility to adapt to specific features of labour supply in older males, for example the need for shorter, less intense and, in general, more flexible work-days[35]. Another sector with an overconcentration of older males is domestic service (27), for the censuses between 1920 and 1950, or food services (23). These two other items also conform to the life-cycle deskilling pattern suggested in our initial hypothesis: low wages[36], minimal qualification requirements, and so on. So far, our results are consistent with those of previous studies. However, they also suggest an inverse pattern of concentration in some 'better' sectors such as the professional classes (21, 1910 and 1920) or administration (26). In these cases, we attribute the high representation of older workers to the fact that they can continue to use abilities and skills generated through experience[37]. This pattern is clearer if we eliminate the heavy weight introduced by agriculture. This modification in fact reconfirms both sides of our argument: on the one hand, the persistence of eldest workers in some of the more attractive, better-paid sectors, and on the other hand, an overconcentration in other occupations consistent with the life-cycle deskilling

[35] See note 30.

[36] Evidence on sectoral wages in Spain for 1910 and 1930 in GÁLVEZ MUÑOZ, ROSÉS (2005), appendix. Our intuition on low-wage sectors is confirmed there.

[37] VICTOR (1987), p.162: *'In Britain, older workers, aged between 55 and retirement age, are over-represented amongst jobs at the extremes of the occupational distribution. We find that older workers are very heavily concentrated in low paid, unskilled jobs such as caretaking and cleaning, agriculture and self-employment. Part-time employment is also very prevalent amongst this age group. However, it is something of a paradox that there are concentrations of older workers in the highest paid and most responsible jobs, such as those within business, commerce or the legal profession'*. For the Spanish case, we find the same type of evidence on the persistence of eldest workers in some of the best sectors in PÉREZ ORTIZ (2005), p. 245.

We believe that this pattern of concentration in some highly regarded sectors may have been less strong had we worked with the 65 year margin, which is actually the one used in earlier studies of this kind. In this case, we might expect a withdrawal of aged workers due to the higher incidence of formal or legal retirement, which must have beeny greater in these sectors rather than in agriculture or domestic service. On the other hand, it is also likely that the incidence of self-employment in some of these 'better' sectors was higher. Therefore, a lower incidence of legal retirement might be derived from this second factor.

pattern: textiles (8), tobacco (7), alcohol and wine (6) or even fishing (2), apart from those already presented in table 3.

Table 4 *Sectoral representativeness of male workers aged 60 and over, (excluding agriculture)*

		1900	*1910*	*1920*	*1930*	*1940*	*1950**	*1970*
1	Agriculture and farming							
2	Fishing	**1.238**	**1.212**	**0.624**	**1.344**	**1.239**	**1.005**	**0.956**
3	Mining	**0.553**	**0.593**	**0.463**	**0.730**	**0.851**	**0.493**	**2.000**
4	Food industries	**0.963**	**0.954**	**0.513**	**0.865**	**1.019**	**1.035**	**0.936**
5	Alcohol and wine	**-**	**-**	**-**	**1.099**	**1.147**	**0.920**	**-**
6	Tobacco	**-**	**-**	**-**	**1.533**	**1.283**	**1.016**	**-**
7	Textile	**1.303**	**1.081**	**0.851**	**1.077**	**1.086**	**0.831**	**1.001**
8	Leather	**0.824**	**0.868**	**0.690**	**0.968**	**1.095**	**1.231**	**-**
9	Dressing and shoe	**0.860**	**0.912**	**0.659**	**1.177**	**1.312**	**0.948**	**-**
10	Paper and printing	**0.500**	**0.519**	**0.724**	**0.636**	**0.734**	**0.869**	**1.140**
11	Wood and furniture	**0.896**	**0.940**	**0.613**	**1.009**	**1.076**	**1.016**	**1.129**
12	Chemicals	**0.846**	**0.816**	**0.731**	**0.966**	**0.918**	**0.690**	**1.428**
13	Building and related products	**1.050**	**1.032**	**0.674**	**0.918**	**0.971**	**0.824**	**1.267**
14	Metals	**0.597**	**0.651**	**0.522**	**0.579**	**0.671**	**0.833**	**1.876**
15	Machinery and tools	**1.148**	**1.003**	**0.523**	**0.987**	**0.847**	**0.552**	**1.936**
16	Transport	**0.991**	**0.959**	**0.771**	**0.678**	**0.779**	**0.588**	**1.225**
17	Electricity, gas and water	**0.326**	**0.317**	**0.679**	**0.489**	**0.656**	**0.814**	**0.838**
18	Trade and retail	**0.844**	**0.732**	**0.938**	**0.883**	**1.138**	**1.326**	**0.656**
19	Storage	**0.664**	**0.705**	**-**	**-**	**-**	**0.971**	**-**
20	Communications	**1.102**	**0.944**	**0.710**	**0.953**	**1.110**	**0.816**	**1.401**
21	Professionals	**1.374**	**1.460**	**1.202**	**1.206**	**1.152**	**1.547**	**-**
22	Clergy	**1.876**	**1.963**	**1.199**	**2.438**	**3.020**	**4.106**	**-**
23	Food services	**1.186**	**1.192**	**-**	**0.943**	**0.910**	**0.950**	**1.051**
24	Services	**1.094**	**0.981**	**-**	**0.878**	**1.022**	**0.833**	**0.633**
25	Army	**0.128**	**0.104**	**0.110**	**0.159**	**0.149**	**-**	**-**
26	Administration	**1.380**	**1.545**	**1.173**	**1.924**	**1.697**	**0.980**	**0.678**
27	Domestic service	**0.977**	**0.919**	**1.079**	**1.527**	**1.902**	**2.154**	**0.889**
28	Labourers	**1.213**	**1.199**	**-**	**-**	**-**	**-**	**-**
29	Others	**1.014**	**1.101**	**1.194**	**1.210**	**1.314**	**1.850**	**1.187**

Source: see table 3.
*aged 65 and more.

Inversely, older workers are underrepresented in technology-driven sectors. These sectors actually present some characteristics that favour younger age-structures, as a result of faster human capital deppreciation. Electricity, gas and water (17), metals (14) would fall under this pattern, spurted by a push factor executed by the employer and his will to renew his labour force. Another factor leading to younger age-structures in a sector is the requirement of strong physical strain on workers and this is clearly illustrated by our indexes in mining (3) or storage (19). In this case, the pull (supply) factor of workers withdrawing due to a decline in their physical ability would dominate. Thus, the *life-cycle deskilling* theory detected by RANSOM and SUTCH for the US and by JOHNSON for England and Wales seems to apply fairly well to Spain, despite considerable overrepresentation in some highly-considered sectors. This would support the idea of the emergence of a segmented labour market born of a new labour structure (specifically, an industrial one), characterized by a relaxation of the qualification requirements in some sectors which previously depended on knowledge of earlier forms of production and, for that reason, offered implicit or explicit long-term contracts[38].

However, the results presented in the tables above may not respond solely to the 'life-cycle deskilling' process. We need to explore the possible action of some other factors before we can conclude that the concentration pattern we showed is the sole cause.

First, the ageing of an industry may be the result of changes in the size of sectors and the corresponding effects of this phenomenon on the mean age in each classification. So, the ageing that appears in some sectors may be the product of their contraction. Assuming that the career profile of workers already employed in that sector was stable, the decline in the sector would reduce the entry of young workers and, in turn would increase the concentration index for

[38] CAMPS (1997), p. 61. Regarding the need for artisan or craft knowledge, we can point to overrepresentation in the wood and furniture sector as an argument in support.

eldest workers. To evaluate the incidence of this factor, we calculate Spearman's rank-order correlation between the percentage growth of workers employed in each sector and each census, and the concentration index of the eldest workers. If a sufficiently negative correlation between these two magnitudes is confirmed, we will have to reject the null hypothesis of no correlation and accept the influence of sectoral decline as an explanatory factor of ageing in some occupations[39].

Our contrasts do not support the alternative hypothesis for the majority of periods for which the exercise was made, that is from 1900 to 1970 and also for each of the intercensal years. Exceptions are the 1930-1940 and 1940-1950 periods. In the former, the statistic -0.50 makes us accept the alternative hypothesis (Spearman's rho critical value at a significance level of 5% and for n=26 observations is -0.392)[40]. With respect to 1940-50, the -0.5733 statistic produces the same result (with n=26, too). Both cases actually correspond to periods affected by serious technical or structural contamination. On the one hand, testing the 1940-1950 period alone is a questionable procedure, since it mixes figures corresponding to workers aged 60 or more with those contained in the 1950 census, with information on workers aged 65 and ove. In this case then, the account for sectoral growth suffers from an inconsistency which probably has to do with the result obtained in the contrast. On the other hand, the conclusion corresponding to the 1930-1940 is surely affected by the shock of the Spanish Civil War.

Beyond that, the stability of the percentage of younger workers employed in some technology-strategic sectors with respect to older workers (*table 5*)

[39] The Spearman contrast consists on assigning a number to each observation. This number corresponds to the ranking given to observations after being classified from highest to lowest. The statistic in each sample is obtained through the formula $\rho=1 - (6\Sigma D^2)/ [N(N^2 – 1)]$, where D is the difference in absolute value between the rank of each pair of observations.

[40] Observations in this pair are actually 27. As this n has no tabulated critical value, we took n=26 as the safest approximation. In all cases, statistics correspond to one-tailed tests.

enforces our rejection of the hypothesis relating ageing with the occupational decline of some sectors.

Table 5 *Percentage of older males employed in some sectors with respect to all males*

	1900		1910		1930		1940		1950		1970	
	20-39	60+	20-39	60+	20-39	60+	20-40	60+	20-34	65+	20-39	60+
chemicals	46,47	6,88	44,68	7,14	48,47	6,81	47,73	7,33	40,71	2,40	55,73	4,17
metals	51,07	4,86	48,94	5,70	50,00	4,08	49,77	5,36	41,05	2,90	50,94	3,18
machinery and tools	45,39	9,35	44,62	8,77	47,57	6,96	47,51	6,76	42,36	1,92	56,45	3,08
electricty, gas, water	62,37	2,65	61,00	2,77	54,78	3,45	51,04	5,23	39,13	2,84	43,38	7,11
agriculture	38,38	13,27	36,55	14,18	39,40	13,07	37,01	15,50	33,49	8,38	33,99	15,17

Source: Population census. Discrepancies between age groups respond to intercensal heterogeneity. Given the excessively general age definitions (see footnote in table 1), the exercise could not be conducted for 1920.

An alternative explanation to our occupational concentration indexes would be the existence of significant differences in mortality rates between classifications: lower mortality in some sectors might lead to a high concentration of older workers. To reject this hypothesis for our chronological framework is by no means easy. Obviously, a considerable mortality differential exists between sectors like mining and agriculture. But in other less extreme considerations, the comparisons are not as straightforward – for example, mortality among land labourers is probably higher than among small tenants. Unfortunately, this sort of judgement suffers from the structural limitation of the absence of professional mortality rates for Spain. The study of foreign cases may prove useful, even though extrapolations are particularly risky. For England, JOHNSON rejected the hypothesis of a consistent relationship between mortality and occupational concentration of older men in some sectors[41]. His conclusion was based on mortality data available at the *Registrar-General of England and Wales*, which summarized data corresponding to each population

[41] JOHNSON (1994), pp. 119-120

census in five classes or wide social groups (not occupations). A proxy that has traditionally been applied to compensate for the scarcity of professional mortality rates is the examination of differences in mortality between town and country. In this case, the results point to a clear differential in favour of rural contexts for Great Britain, France and the US during the second half of the nineteenth century but the same evidence also suggests that this differential or urban penalty disappeared, and in some cases even reversed, during the first decades of the twentieth[42]. Data from Spain seem to support this argument: whereas mortality was higher in towns[43] during the nineteenth century, the differential progressively narrowed until, after the Civil War, mortality rates in town were below those in the country[44]. But even before, between 1900 and 1930, REHER notes *'the fall in mortality in the countryside was always higher than in the city, except for one age group (60-69)'*[45]. It thus appears that the old-age concentration in the agricultural sector seems to respond to more than just the hypothetical mortality differentials between occupations. In fact, in our opinion, the analysis of occupational mortality figures may finally support the existence of significant differentials and, at the same time, the action of a life-cycle deskilling pattern during an individual's career. It seems reasonable to think that the more severe physical strain of some occupations, if manifested gradually, would lead subjects to seek less physically-demanding jobs within a sector and, of course, to move to other sectors as well[46]. Actually, the push factor in this situation is mortality or, more exactly, morbidity or the loss of

[42] HAINES (1991), p. 181. On the urban penalty, which made urban growth impossible without inmigration, WRIGLEY, DAVIES, OEPPEN, SCHOFIELD (1997), pp. 201-206.
[43] Town is assimilated to the main city of each province. This should not always correspond to urbanized areas.
[44] REHER (1998), p. 66-67.
[45] REHER (1998), p. 80
[46] HAINES (1991), p. 179. This pattern might explain the puzzle in the professional classification elaborated by USELDING and examined by RANSOM & SUTCH (1986) for the US: *'Uselding's finding that industrial jobs were 'healthier' than other ocupations is more likely the result of downward occupational mobility than and early retirement than evidence that industrial safety standards were high'*, p. 26.

abilities, suggesting an earlier death. In any case, the reaction against this situation is also the life-cycle deskilling dynamic which, both from the supply and the demand side, appears as a practical expression of problems in the labour market.

Lastly, we should also consider the possibility that our pattern of occupational concentration responds to differential retirement rates between sectors. Our data are cross-sectional and so do not allow us to derive any conclusions on this point. To be able to do so, we would need longitudinal records for a complete assessment, over time, of a given group of individuals. If a stable differential retirement behaviour is confirmed, we could point to those sectors in which workers complete their careers with enough resources to face old age. Thus, variations in retirement decisions would be linked to different saving patterns, either voluntary – individual or professional – or compulsory, if the unequal sectoral effect of early public pensions in Spain is considered. Also, the uneven incidence of self-employment between sectors should be noticed, and it can be presumed that higher levels of self-employment lead to lower levels of retirement.

To sum up, some of the findings mean that we cannot conclusively attribute our occupational concentration indexes to a process of *life-cycle deskilling* or *downward occupational mobility*. We cannot rule out the existence of differential retirement patterns. Also, the evidence on mortality differentials is not clear-cut enough to be able to discount their effects. Despite this, we believe that our results offer suggestive and robust conclusions in support of a gradual expulsion of Spanish workers towards less attractive sectors as their age increases. There are several reasons for this pattern of horizontal segmentation of older males in the labour market[47]. Both supply and demand side factors play a part in this phenomenon, sometimes in interrelated ways. From the demand

[47] Horizontal or within-sector segmentation is in fact the only one that we can detect with our source. Vertical segmentation may be equally plausible, according to which eldest workers would be occupied in lower jobs within a same sector of work.

side, there is no doubt that employers discriminate against older workers. The perception of a decline in their abilities may mean that older employees are moved to jobs requiring less skill and training and involving less responsibility. Two factors play a fundamental role in this discrimination: on the one hand, educational progress between cohorts and, on the other, technological change. Technological change complicates the adaptation of workers of all kinds, not only those with declining skills, but employers will be less interested in retraining a worker who is close to the end of his career[48]. All these elements add reasons for the preference for younger workers or the direct expulsion of older employees.

On the other hand, the move towards poorly-regarded sectors may be partially motivated by the preferences of the worker himself. For instance, the perception of one's declining strength might encourage voluntary withdrawal from sectors in which physical demands are high, or which do not allow shorter workdays. The inflexibility associated with team work or with many mechanized procedures required to achieve high productivity levels may well cause workers to seek more adaptable sectors. At the same time, the specific character of lifetime human capital acquired in a single job may also force workers to change sector[49]. Thus, a greater demand of low-skilled labour or the rise in service activities – assumed to be more flexible – would in theory favour the work prospects of older workers[50]. In fact, the increase of self-employment experienced at older ages would fit the labour pattern sketched for old age[51]. In spite of the cohort effect, it is no less true that the possibility of escaping age-discrimination and of administering one's own time may well influence the

[48] COSTA (1998), p. 24 on the effect of high-school education since the 1920s; JACOBS, KOHLI, REIN (1991b), p. 68 on technological change, KOHLI, REIN (1991), p. 16 on the costs of requalification. On this same issue, COLLIS, MALLIER, SMITH-CANHAM (1999), pp. 47-61 point at the lower participation of older workers in qualification programs.
[49] HURD (1996), p. 13
[50] RANSOM, SUTCH (1986), p. 19
[51] JOHNSON, ZIMMERMANN. (1993), p. 56

preference for self-employment or informal work at older ages. Lastly, passing the peak earning years – around 40-50 years, in more productive professions – may also encourage workers to withdraw from more profitable, but more demanding, occupations. Thus – and assuming the absence of long-term agreements within the firm – we would detect incentives to choose occupations with shorter hours and fewer demands as a way to increase leisure time once earnings begin to fall[52].

VI. Conclusions

This article analyses the working patterns of Spanish older men over a long time period, using a fundamentally quantitative perspective. Our main source was the national population census. Though not without its problems, the source has provided some important evidence. First, we found that employment rates for men aged 60 and over were very high until 1970, when they fell sharply, due clearly to the introduction of a modern social security system in the previous decade. Though we should note that the self-report procedure in the censuses probably distorts these results, the same system has been used in other countries. Our corrections of these rates in relation to structural changes in the economy suggest that the propensity to retirement in the traditional sector was lower than in the rest. So it seems clear that workers remained in employment for longer, especially viewed from the perspectives of today. This phenomenon had already been recognized by contemporary authors who took an interest in the situation of older workers and, more particularly, by policy-makers responsible for designing the first measures for protecting this population. These same authors noted the adverse effects for older workers who found themselves

[52] WISE (1993), pp. 51-52

removed from their traditional jobs and with insufficient resources to guarantee a decent retirement.

Much of this paper has tested this intuition. We first observed that older workers were overrepresented in low-skilled, low-wage sectors, even though a strong presence in some high-qualified sectors (professionals) was also confirmed. The next step was to explore whether this sectoral distribution of older workers responded to their expulsion from the relatively good occupations they had held at younger ages. This was the hypothesis of the Spanish reformist authors, which has been borne out in studies of other countries that established the concept of *downward occupational mobility* or *life-cycle deskilling*. In our study we progressively compared other factors that might also have been behind the pattern of employment observed. First, we rejected the hypothesis that ageing in certain sectors is related to the contraction of these sectors, manifested by a fall in new entrants. In other words, we were able to reject the idea of a cohort effect in which old workers were overrepresented because they remained in traditional sectors. The only periods in which our calculations appear shaky are the aftermath of the Civil War and the year 1950, in the latter case due to the technical distortion introduced by the census records. Second, we analysed the effect of mortality differentials. Mortality differentials between occupations may narrow considerably if one accepts town-country mortality data as a decent proxy, though this variable definitely plays a role in some sectors. Nonetheless, the consideration of morbidity or greater physical strain in some sectors supports the existence of a work-degrading pattern, this time as a result of a forced decision by the worker. This need for occupations that are less physically demanding and more adaptable to a flexible provision of work may explain the downward phenomenon. Costs associated with reallocation inside the same segment of work are also part of the argument. Demand naturally plays a major – if not crucial – role in this dynamic. In this respect, the effects of technical change and educational leaps between cohorts are also assumed to exacerbate

the removal of workers who tend to be perceived as less productive. In conclusion, the paper stresses the existence of a relevant problem affecting older workers in labour markets.

VII. References

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VIII. Appendix

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